

DISCUSSION OF THE AMENDMENT

Due to the length of the specification herein, Applicants will cite to the paragraph number of the published patent application (PG Pub) of the present application, i.e., US 2007/0155646, when discussing the application description, both in this section and in the Remarks section, *infra*, rather than to page and line of the specification as filed.

Claims 1 and 12 have each been amended according to a preferred embodiment, as supported in the specification at paragraphs [0075]-[0078], and Claim 9.

Claim 9 has been amended by deleting “at least” and to be otherwise consistent with Claims 1 and 12.

No new matter is believed to have been added by the above amendment. Claims 1-4 and 6-14 remain pending in the application.

REMARKS

The rejection of Claims 1-4 and 6-8 under 35 U.S.C. § 102(b) as anticipated by US 6,573,228 (Littig et al), is respectfully traversed.

Above-amended Claim 1 is drawn to a composition for treating hard surfaces, which composition, as component A thereof, is at least one water-soluble or water-dispersible compound which is prepared by

- aa) **first crosslinking** a compound selected from the group consisting of polyalkylenepolyamines, polyamidoamines grafted with ethyleneimine, polyether-amines and mixtures of said compounds, as component Aa,
- ab) with a compound selected from the group consisting of bifunctional crosslinkers having, as a functional group, a halogenhydrin, glycidyl, aziridine or isocyanate unit or a halogen atom, as component Ab, thereby forming a crosslinked reaction product, and
- ac) **then** reacting the crosslinked reaction product with a monoethylenically unsaturated carboxylic acid selected from the group consisting of acrylic acid, methacrylic acid, ethylacrylic acid, salts, esters, amides or nitriles of monoethylenically unsaturated carboxylic acids, and mixtures thereof [Michael addition].

As previously pointed out, Littig et al discloses laundry detergent compositions comprising so-called fabric enhancement polyamines which comprise one or more modified polyamine compounds selected from:

- i)  $(PA)_w(T)_x$ ;
- ii)  $(PA)_w(L)_z$ ;
- iii)  $[(PA)_w(T)_x]_y[L]_z$ ; and

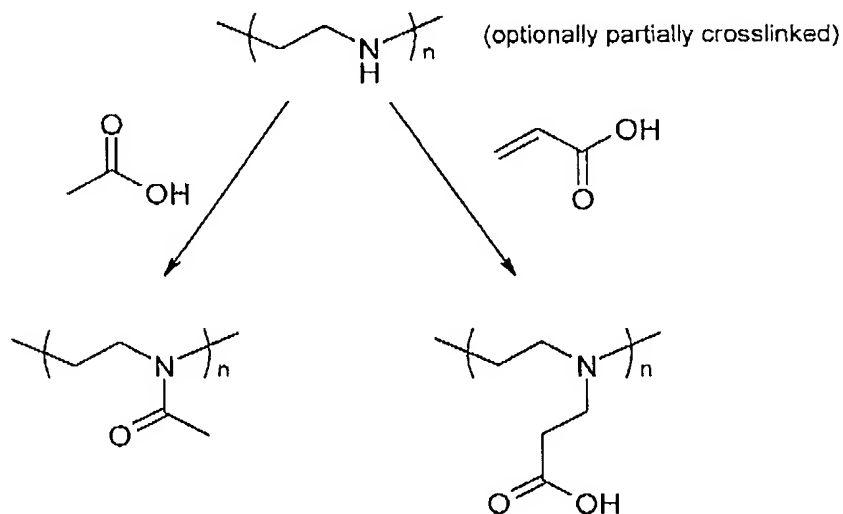
iv) mixtures thereof (column 1, line 61 to column 2, line 1).

PA is a grafted or non-grafted, modified or unmodified polyamine backbone unit, T is an amide-forming polycarboxylic acid cross-linking unit, and L is a non-amide-forming cross-linking unit (column 2, lines 1-5). Suitable polyamine backbones (PA units) are, for example, polyalkyleneimines or polyalkyleneamines (column 3, lines 30-38). The polyamine backbone may be modified by grafting or capping (column 5, lines 13-16). The grafting is carried out for example with aziridine (ethyleneimine), caprolactam or mixtures thereof, as grafting agents (column 5, lines 35-37) and the grafting can be carried out prior to or after cross-linking with one or more T-units, whereby the grafting is preferably accomplished after cross-linking with the T-unit (column 5, lines 51-54). The capping is carried out by reaction of the PA-unit with a monocarboxylic acid. Suitable monocarboxylic acids disclosed are C<sub>1</sub>-C<sub>22</sub> linear or branched alkyl, preferably C<sub>10</sub>-C<sub>18</sub> linear alkyl carboxylic acids like lauric acid and myristic acid (column 5, lines 60-65), which are the only acids explicitly listed. The cross-linking units T are amide-forming cross-linking units, for example, dibasic acids such as succinic acid, maleic acid, adipic acid, glutaric acid, suberic acid, sebacic acid and terephthalic acid (column 6, lines 28-31). Non-amide-forming cross-linking units L are, for example, epihalohydrins (column 6, lines 54-56).

Littig et al discloses **no** mono-ethylenically unsaturated carboxylic acids selected from acrylic acid, methacrylic acid and ethylacrylic acid (which are not used as cross-linking units according to the present invention), as cross-linking units or as capping units. Indeed, the monocarboxylic acids listed as capping units in Littig et al are not monoethylenically unsaturated short-chain acids but rather, saturated, preferably long-chain (C<sub>10</sub>-C<sub>18</sub>), acids (column 5, lines 60-65). Thus, in Littig et al, the reaction of a polyamine backbone with a saturated monocarboxylic acid as a capping unit results in an amide having an alkyl, preferably long-chain alkyl, unit. In the presently-claimed invention of Claim 1, on the other

hand, the reaction of the polyalkylene polyamine with the monoethylenically unsaturated carboxylic acid produces a Michael-product obtained by a Michael-reaction, because of the  $\alpha,\beta$ -ethylenically unsaturation of the carboxylic acid employed.

In the following scheme the different reaction products by reacting polyethylene imine with a saturated monocarboxylic acid under formation of an amide and with an  $\alpha,\beta$ -unsaturated carboxylic acid by a Michael-addition are shown:



It is shown that the water-soluble compound A according to the present invention and the amide according to Littig et al are clearly different. Because of the different modification of the polyamino compounds according to the present invention and according to Littig et al, the modified polyamine compounds according to the present invention and according to Littig et al have different properties, especially concerning the interaction with surfaces, especially hard surfaces.

Thus, according to Littig et al monocarboxylic acids like acrylic acid may be used as cross-linking agents to cross-link polyalkyleneimines or polyalkyleneimines grafted with ethyleneimines. Prior to the cross-linking, the polyalkyleneimines or polyalkyleneimines grafted with ethyleneimines may be partially amidated. No amidation of the cross-linked products takes place in the preparation process according to the present invention. Further,

no Michael addition of a cross-linked product takes place in Littig et al. Therefore, not only the order of the reaction is changed in the process according to the present invention compared to the process according to Littig et al., but also different reaction steps are carried out leading necessarily to different products.

The products obtained are therefore clearly different and the products especially comprise a completely different polarity, which is important for the usefulness of said products for treating hard surfaces.

In effect, Littig et al. is irrelevant, because their modified polyamine compounds are different from, and not suggestive of, presently-recited component A, and their disclosed utility is not the treatment of hard surfaces.

For all the above reasons, it is respectfully requested that the rejection be withdrawn.

The rejection of Claims 9 and 10 under 35 U.S.C. § 102(b) as anticipated by US 5,641,855 (Scherr et al.), is respectfully traversed.

Above-amended Claim 9 is drawn to a process for the preparation of a water-soluble or water-dispersible compound consisting of:

- i) crosslinking of a compound selected from the group consisting of polyalkylenepolyamines, polyamidoamines grafted with ethyleneimine, polyether-amines, and mixtures of said compounds as component Aa, with

a compound selected from the group consisting of bifunctional crosslinkers having, as functional group, a halogenhydrin, glycidyl, aziridine or isocyanate unit or a halogen atom, as component Ab;

and

- ii) reaction of the product obtained in step i) with a monoethylenically unsaturated carboxylic acid selected from the group consisting of acrylic acid, methacrylic

acid, ethylacrylic acid, salts, esters, amides or nitriles of monoethylenically unsaturated carboxylic acids, and mixtures thereof, as component Ac.

As previously pointed out, Scherr et al discloses water-soluble condensation products of amino-containing compounds and crosslinkers, obtainable by reacting components described therein as compounds (a), (b) and (c) (paragraph bridging columns 1 and 2), which condensation products are disclosed as used as drainage, flocculation and retention aids in papermaking (column 2, lines 23-25; column 6, lines 27-29). Scherr et al discloses further that their condensation products are prepared by reacting compound (a) with compound (b) and then reacting the product with compound (c), or by reacting the compounds (a), (b) and (c) all together (column 2, lines 16-23). In Scherr et al, compounds (a), (b) and (c) correspond to presently-recited components Aa, Ac, and Ab, respectively (except component Ac, which is narrower than compound (b).).

Thus, contrary to present Claim 9, which recites reacting components Aa and Ab to form a reaction product, and then reacting this reaction product with component Ac, using Applicants' nomenclature of Aa, Ab, and Ac, Scherr et al either reacts components Aa and Ac to form a reaction product, and then reacts this reaction product with component Ab, or reacts Aa, Ab and Ac at the same time.

Thus, it is clear that neither of the two alternative processes disclosed by Scherr et al anticipates Claim 9. Nor would it have been obvious to alter the order of reaction in Scherr et al since even a chemist with the most rudimentary knowledge of chemistry would appreciate that the product formed by altering the order of reaction would result in a different product.

In addition, since the presently-claimed process of Claim 9 necessarily produces a product different from that produced by either of the two processes of Scherr et al, the compound of Claim 10 is also necessarily different and thus patentable.

In response to the above arguments, the Examiner finds that “[a]ccording to MPEP, changing in the order of the reaction is not patentable unless it shows critical evidence or issue.”

In reply, there is **no** applicable precedent in the MPEP or case law for the above-quoted finding. Clearly, the significance of order of reaction depends on the facts of the case. In some cases, the order of reaction makes no difference. In other cases, where the second reaction necessarily involves reaction with the product of the first reaction, the order obviously makes a difference as a matter of simple chemistry. Nevertheless, such criticality has been shown herein.

In the present case, the order of reaction shows critical evidence, because completely different products are obtained if the crosslinking of the polyalkylenepolyamines, polyamidoamines grafted with ethylene imines, polyetheramines or mixtures thereof is carried out before the reaction with the monoethylenically unsaturated carboxylic acid or after the reaction with a monoethylenically unsaturated acid. In the first case, which is as the presently-claimed invention, wherein the crosslinking is carried out first, a crosslinking of the main chain of the polyalkylenepolyamines, polyamidoamines grafted with ethyleneimine or polyetheramines occurs and no crosslinking of the side chains which are introduced by reaction with the monoethylenically unsaturated carboxylic acids occurs. However, in the second case, if the reaction with the monoethylenically unsaturated carboxylic acids is carried out first and thereafter a crosslinking occurs, the crosslinking occurs also between the side chains of the compounds comprising side chains derived from the monoethylenically unsaturated carboxylic acids.

For all the above reasons, it is respectfully requested that this rejection be withdrawn.

The rejection of Claims 11-14 under 35 U.S.C. § 103(a) over Littig et al in view of US 2003/0195135 (Boeckh et al), is respectfully traversed.

Claims 11-14 are drawn to a process for the treatment of hard surfaces. Claims 11, 13 and 14 require the composition of Claim 1. Claim 12 requires, in effect, only component A of Claim 1.

As previously pointed out, Boeckh et al discloses particular cationically modified, particulate, hydrophobic polymers, the surfaces of which have been cationically modified by coating with cationic polymers, and the particle size of which is 10 nm to 100  $\mu\text{m}$ , as additives to rinse, cleaning and impregnation compositions for hard surfaces (Abstract). Present component A, on the other hand, is recited as water-soluble or water-dispersible and for this reason alone, is different from the hydrophobic polymers of Boeckh et al. Boeckh et al's hydrophobic polymers are obtainable, for example, by polymerization of, in effect, monoethylenically unsaturated monomers [0015ff], which are cationically modified by cationic polymers containing, for example, vinyl amine units, including polyethylene imines and crosslinked polyethylene imines, *inter alia* [0047]. Thus, it is clear that the polymeric backbone of Boeckh et al's hydrophobic polymers is a hydrophobic acrylate-type polymer. On the other hand, present component A is a water-soluble or water-dispersible compound having a backbone of polyalkylene polyamine, polyamidoamine, polyamidoamine grafted with ethylene amine, polyether amine, or mixtures thereof, recited as component Aa. Thus, the water-soluble or water-dispersible compounds are polyalkylene polyamines or similar polymers. Nor are these compounds cationically modified as required by Boeckh et al. While component A is recited in product-by-process form, it is clear that component A could not possibly be the hydrophobic polymers of Boeckh et al.

The Examiner appears to hold that it would have been obvious to use the so-called fabric enhancement polyamines of Littig et al to clean hard surfaces in view of Boeckh et al. In so holding, the Examiner finds that Littig et al and Boeckh et al are "analogous art because



they are in the same field of endeavor, namely, a cleaning composition comprising the similar compound which is used as soil release agent.”

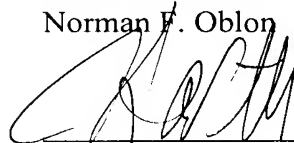
In reply, Littig et al and Boeckh et al are non-analogous art because they are not in the same field of endeavor, i.e., cleaning hard surfaces and cleaning laundry are different fields of endeavor, and even though not in the same field of endeavor, nor is Littig et al reasonably pertinent to the particular problem with which Applicants are involved. Nevertheless, even if analogous art, Applicants have shown above why the presently-recited component A (Claims 11, 13 and 14) or water-soluble or water-dispersible compound (Claim 12) is different from, and not suggested by, Littig et al. Alternatively, there is no motivation to substitute the cationically modified hydrophobic polymers of Boeckh et al with the above-discussed hydrophilic polymers of Littig et al. In addition, since Boeckh et al disclose cationically modified hydrophobic polymers for the treatment of hard surfaces, Boeckh et al lead away from the use of the specific hydrophilic polymers for treating hard surfaces as claimed herein.

For all the above reasons, it is respectfully requested that the rejections be withdrawn.

All of the presently-pending claims in this application are now believed to be in immediate condition for allowance. Accordingly, the Examiner is respectfully requested to pass this application to issue.

Respectfully submitted,

OBLON, SPIVAK, McCLELLAND,  
MAIER & NEUSTADT, P.C.  
Norman F. Oblon



Harris A. Pitlick  
Registration No. 38,779

Customer Number  
**22850**

Tel: (703) 413-3000  
Fax: (703) 413 -2220  
(OSMMN 08/07)

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